



BEEF

Chapter 43

Calf Price Information and Risk

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Introduction

Cow-calf producers in South Dakota typically sell their calf crops shortly after weaning. Generally, the largest volume of sales occurs during October and November, with calves commonly weighing 500–600 lbs. For an overview of the general livestock markets see CME Group (2014). Auction markets are common outlets for those calves and are competitive outlets due to the large number of sellers and buyers. Marketing on a single sale date and location concentrates the price risk. That risk could be managed or transferred to other parties. Other marketing methods may also be considered to reduce transactions costs. The purpose of this chapter is to highlight sources of price information and discuss ways to use that information when marketing calves.

Potential hedgers have access to better price information than in the past because more futures contracts are traded and more forward price reports are available. There are trade-offs when using the strategies presented below. Basis is a consideration, and basis risk can be quite large when cross-hedging calves against feeder cattle contracts. The drawbacks, however, may be acceptable if producers can capture a profitable calf price. Because multiple tools are available, a producer can also diversify by using more than one pricing strategy.

Calves are often sold in the cash market at the same time of the year each year. Always hedging calves at the same time of year would be like just moving the sale date. Alternatively, one could use selective hedging, or hedging when the price is deemed satisfactory, as a strategy for livestock producers to capture favorable prices when presented.

Price Information

A survey of ranchers in North Dakota, South Dakota, Montana and Wyoming, found that 81 percent of them used a local or auction market (Hodur, et al. 2007). A common source for auction prices is USDA Agricultural Marketing Service (USDAAMS) reported

Key Points

- Price information is available for auctions and direct sales from USDA-AMS.
- Price information is available for futures and options from CME Group.
- Risks common to calf prices include: seasonality, downside price moves of feeder cattle, and basis risk.
- Selling futures and forward contracting can lock in prices for calves.
- Buying put options can protect against lower prices.

sales. The market reporters are unbiased parties using common feeder cattle grades that make transactions comparable across locations (USDA, 2000). The values of different features specific to auctions have been documented at the aggregate level, such as premiums for larger lot sizes, for calves originating in the North Central region, and for weaned calves (Zimmerman, et al., 2012).

AMS-reported sales in South Dakota include: Ft. Pierre Livestock Auction Inc. (Ft. Pierre), Herreid Livestock Auction Inc. (Herreid), Hub City Livestock Auction Inc. (Aberdeen), Mitchell Livestock Marketing LLC (Mitchell), Mobridge Livestock Market Inc. (Mobridge), Philip Livestock Auction LLC (Philip), and Sioux Falls Regional Livestock (Worthing). Each of these locations handled over 100,000 head of cattle during fiscal year 2014, which ended June 30, 2014. Each of these locations has weekly sales (some seasonally) documented in separate reports and combined in summary reports (www.ams.usda.gov).

Video auction sales, e.g., Superior Livestock Auction and Northern Livestock Video Auction, commonly list feeder cattle sourced from north-central states (a region that includes South Dakota). During the summer months, there are often forward sales quoted from this region for cattle to be delivered at a future date. In addition, there are direct sales reported for South Dakota (joint with North Dakota) and for Southwestern South Dakota (combined with Wyoming, western Nebraska and western North Dakota). Direct sales are often for current delivery and sometimes are for deferred delivery months. The AMS releases the weekly “National Feeder and Stocker Cattle Summary” report on Fridays.

Feeder cattle futures are often used as a guide for calf prices. While it is true that the weights used to define the feeder cattle futures contract are different than typical calf selling weights (heavier), the futures prices are a source of information that is driven by a large number of traders both buying and selling the contracts. Details of the futures and options contract specifications are spelled out in the CME Rulebook (cmegroup.com). Feeder cattle contracts are for a fixed total amount, 50,000 lbs. of beef

steers weighing 650-849 lbs. Prices are quoted in \$/cwt. The contracts are cash-settled to the CME Feeder Cattle Index®, which is a weighted-average of AMS-reported feeder cattle sales. Contracts are listed and trade for January, March, April, May, August, September, October, and November. Futures and options settle on the last Thursday of the month, unless affected by a holiday.

Scope of Risk

Production risk and price risk are two important categories of risk that cow-calf producers face. If production risk is high, then a producer would not want to price cattle of a specific weight. Producers perceive the price risk of selling cattle as a major risk (Hall, et al. 2003). However, the same survey found that cattle producers did not rate futures, options, and forward contracts as highly effective in helping to manage price risk. Price risk encompasses both the likelihood that prices will change (the specific risk producers are concerned about is a price decline), and the magnitude of any price change.

Seasonal variability is one source of price risk for cow-calf producers. A monthly weighted-average price for 500-599 lb. steers reported for South Dakota was used to find a seasonal price index (Figure 1). Seasonally, the price is lowest in January and highest in June. There is also some seasonal price pressure evident in November. The variability in the price, as measured by the standard deviation of the index, is also high from November through February, suggesting that during those months there is increased price risk. An annual price projection could be modified by the appropriate seasonal index factor to obtain a month-specific price. For example, the factor in November is 99.0. Thus if one had

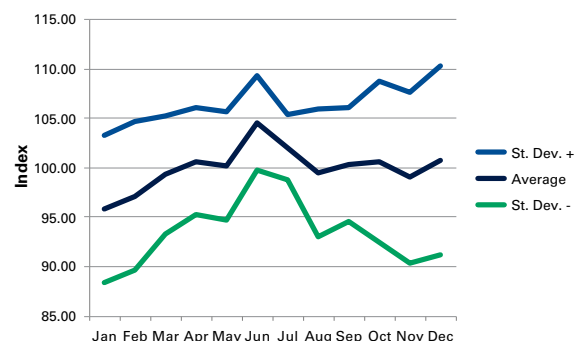


Figure 1: Seasonal Price Index for 500-600 lb. Steers in South Dakota, 2005-2014.

an annual price forecast for calves of \$200.00, the adjustment factor for November suggests a price forecast of \$198.00 for the month of November in that year.

Downside price risk in the calf market is substantial for several reasons. There is a long lag between when a cow is bred and when a calf is sold. The fed cattle market can fluctuate based on consumer demand and the cattle cycle. The corn market may have large swings in production levels and prices. These factors cause both expected calf prices and actual or observed calf prices to change. If actual prices exceed expected prices, then unhedged producers are usually financially better off. However, downside price moves may turn marginal expected enterprise profits into losses given the large costs incurred during the production cycle of a cow-calf operation. Traditional hedging techniques, such as futures hedges and forward price contracts can be used to manage downside price risk. These tools essentially fix the price, so while downside risk is managed, the benefit of upside moves is also eliminated.

To quantify the downside risk, consider a specific case of a cow-calf producer planning to sell calves in November. Starting in June, consider changes in historic November feeder cattle futures prices from June through November. During the last decade, the price has increased five of those years and decreased five of those years (Figure 2). In years the price declined, the average change was -\$8.62 per cwt.

Because the declines only happened half of the time, the expected outcome from future scenarios would average -\$4.31 per cwt. in years when prices

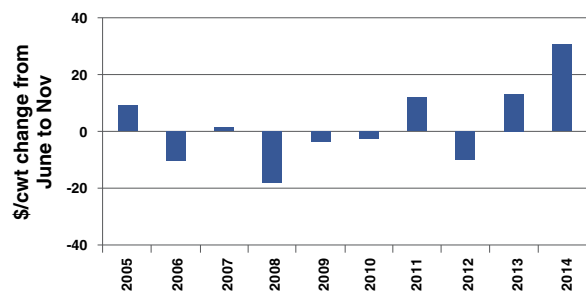


Figure 2: November Feeder Cattle Futures Price Changes.

decline. The cost to lay off such risk in the future is quantified by the implied volatility of options. In recent years, the futures price has declined by as much as \$17.57 per cwt and increased by as much as \$30.45 per cwt. Thus, there can be significant downside risk, but producers also have the potential for prices to move substantially higher during the June through November time period.

Another issue to consider when managing price risk for calves is basis risk. The calf basis is defined as the difference between the cash price for calves and the nearby feeder cattle futures contract (Figure 3). For a cow-calf producer selling calves at weaning time, the cash price of interest is generally for steer calves weighing 500–600 lbs. The feeder futures contract reflects steers weighing 650–849 lbs. Thus, basis risk exists compared to pricing feeder-weight cattle. From 2005 through 2014 basis for steer calves in South Dakota ranged from \$8.90 to \$56.04 per cwt over (or above) the monthly average of the November futures prices.

In general, the basis for calves is positive in South Dakota. For a recent history of monthly prices and basis levels in South Dakota see Diersen (2015). For planning purposes, when prices have been stable a month-specific 3- or 5-year average basis would smooth out small aberrations and serve as an expected basis. Note, basis tends to be high in years when feeder cattle futures prices are relatively high during the early summer months. Basis tends to move lower with higher corn and/or hay prices, and it tends to move higher with higher live cattle futures prices (Diersen and Klein, 2000). Following recent periods of large fluctuations in live cattle futures,

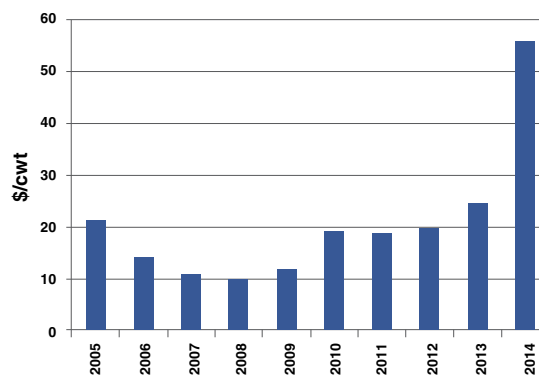


Figure 3: South Dakota Calf Basis, November Cash minus Futures.

feeder cattle futures, corn prices and hay prices, expected basis could be derived by heavily-weighting recent years in the calculation of the average, or could be calculated based on projected feed costs and feeder cattle prices.

Marketing Strategies

One way to capture calf prices that look attractive at some time before the calves are actually ready to be sold is to use cash-forward contracts. The buyer and seller directly negotiate an agreement regarding price, weight, weighing conditions, delivery date, and delivery costs and terms. Counter-party risk exists using forward contracts, as one of the parties may be unable to fulfill the contractual obligations either at all or in a timely manner. Most direct quotes that include South Dakota are sales that are free on board (FOB) with a 2-3 percent pencil shrink and a 5 to 10 cent slide on calves from base weights. A forward contract, by setting the price, eliminates basis risk. Compared to the futures market, the forward contract market for calves is thinly traded and reported. Another pricing strategy before a cash sale date is to sell futures. Calves can be hedged using feeder cattle futures contracts. For the producer planning to sell calves at a future time, a futures hedge is placed by selling feeder

cattle futures. Dividing the 50,000 lb feeder cattle contracts by 555 lbs implies about 90 calves can be hedged with each contract. To trade contracts, producers will need a broker to handle the futures market transactions and perhaps a lender who is kept well informed of the marketing plan to finance potential margin calls.

Consider how a cow-calf producer in June could hedge calves intended to be sold in late October through November using the November feeder cattle futures. The prices are all per cwt unless noted. In June the futures contract is trading at \$150.00. Expecting a basis on calves of \$20.00 yields an expected net price received of \$170.00. To establish such a price, the producer would sell a November futures contract in June (covering 90 head at a time). By November, the futures price may fluctuate or stay at \$150.00. Different futures position outcomes are shown in Table 1. If the futures price does not change the futures contract is bought back and the primary cost would be a small commission (Scenario A). This strategy provides protection during the intervening months, perhaps with margin calls, but the price received at the end matched what was expected.

Table 1: Selling a futures contract with basis constant (\$/cwt)

A. Futures at 150	Cash Market	Futures	Basis
June	Expect 170	Sell Nov 150	Expect +20
November	Sell 170	Buy back 150	Actual +20
---	Cash Market	Futures	Net Price Received
---	170	No Change	170

B. Futures fall to 135	Cash Market	Futures	Basis
June	Expected 170	Sell Nov 150	Expected +20
November	Sell 155	Buy back 135	Actual +20
---	Cash Market	Futures Gain/Loss	Net Price Received
---	155	15	170

C. Futures rise to 175	Cash Market	Futures	Basis
June	Expected 170	Sell Nov 150	Expected +20
November	Sell 195	Buy back 175	Actual +20
---	Cash Market	Futures Gain/Loss	Net Price Received
---	195	-15	170

Note: With a typical full-service brokerage commission charge of \$75 per contract, the net price would be reduced by \$0.15.

Should the futures price decrease to \$135.00 by November, the producer would buy back the futures contract for less than it was initially sold for (Scenario B). The result is a futures gain of \$15.00 (before commissions). However, the cash price received for the calves (\$155.00) is lower reflecting basis that matched expectations. The net price received would thus be \$170.00, or the same as expected. Alternatively, should the futures price increase to \$175.00 by November, the producer would pay margin calls and eventually buy back the futures contract for more than its initial selling price (Scenario C). The result is a futures loss of \$15.00 (before commissions). In this case the cash price received for the calves (\$195.00) is higher than expected, again reflecting basis that matched expectations. Thus, again the net price received would be \$170.00, or the same as expected. In these futures scenarios the basis remained constant. Examples showing the effects of basis changes are provided in Chapter 44.

Another way to hedge calves is to use feeder cattle put options. Buying put options leaves the upside open so if prices increase, a hedger may see increased returns. Put options come at a cost, a premium payable at the time of purchase. Consider a put option with a strike price of \$150.00 and

Table 2: Buying a put option with basis constant (\$/cwt)

D. Futures at 150	Cash Market	Put Option	Basis
June	Expect 170	Buy Nov 150 for 5	Expect +20
November	Sell 170	Let Expire	Actual +20
---	Cash Market	Option Net	Net Price Received
---	170	-5	165

E. Futures fall to 135	Cash Market	Put Option	Basis
June	Expected 170	Buy Nov 150 for 5	Expected +20
November	Sell 155	Sell for 15	Actual +20
---	Cash Market	Option Net	Net Price Received
---	155	10	165

F. Futures rise to 175	Cash Market	Put Option	Basis
June	Expected 170	Buy Nov 150 for 5	Expected +20
November	Sell 195	Let Expire	Actual +20
---	Cash Market	Option Net	Net Price Received
---	195	-5	190

Note: With a typical full-service brokerage commission charge of \$75 per contract, the net price would be reduced by \$0.15.

a premium of \$5.00. Because the contract is for 50,000 lbs., the total premium cost is \$2,500 plus a broker commission. To protect 90 head of calves, the premium cost would be \$27.78 per head. From the strike price (\$150.00), subtract the premium level (\$5.00) and add the expected basis (\$20.00) to obtain the expected minimum price of \$165.00.

Different put option position outcomes for the example are shown in Table 2. When the futures price ends the period unchanged, the put option would not have value (Scenario D). The cost for the strategy would be the \$5.00 premium resulting in a net price of \$165.00. Should the futures price decrease to \$135.00 by November, the producer would sell back the put option for \$15.00, which is the difference between the futures price and the strike price (Scenario E). The result is a net option gain of \$10.00 (less any commissions). However, the cash price received for the calves (\$155.00) is lower giving a net price received of \$165.00.

Should the futures price increase to \$175.00 by November, the producer would let the put option expire without value (Scenario F). The result is an option cost of \$5.00. In this case the cash price received for the calves (\$195.00) is higher giving a net price received of \$190.00. In these option

scenarios the basis remained constant. Examples showing the effects of basis changes are provided in Chapter 44.

Conclusions

Price information to manage calf price risk is available from USDA-AMS and CME Group. Seasonal price changes, downside price moves and basis risk are necessary to consider when hedging. When evaluating different pricing strategies, forward prices should be compared to feeder cattle futures prices plus the calf basis. The pricing strategy with the higher expected price would likely be preferred. The seller forgoes any price increase once calves are contracted or hedged with futures. Buying a put option is another way to hedge calf price risk. While a put option has an up-front cost, it maintains the potential for higher returns if prices go up. Cattle producers with a significant number of calves to sell will often complete a marketing plan. This may be as informal as picking a sale date and location with a formed price expectation. It may also be a formal written plan with various pricing and protection strategies to augment cash transactions. Such plans also have action dates and contingencies. A good record system helps to track sales, such as the IRM Red Book, but also to track hedging returns.

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